

REMARKS

The Office Action dated June 30, 2006, has been reviewed carefully and amendments have been made herein, which are believed to place the application in condition for allowance. All objections and rejections are respectfully traversed. Claims 1-22 were pending in the application. Claims 1, 11, 17, and 19-22, have been cancelled herein without prejudice.

Response to Priority Statement

Applicant has deleted the objected to subject matter as set forth by the Examiner. Therefore, Applicant respectfully submits that the entire subject matter claimed herein is entitled to the benefit of the filing date of the earlier filed application, namely United States Patent Application Serial No. 09/990,818, filed November 14, 2001.

Information Disclosure Statement

Applicant respectfully acknowledges the Examiner's indication that the Information Disclosure Statement was in compliance with provisions to 37 C.F.R. § 1.97.

Objection to the Amendment

The Amendment filed on April 27, 2006 was objected to on the basis that it introduced new matter into the disclosure. Each instance of added material objected to by the Examiner is addressed herein.

In claim 2, the phrase "objective function" has been deleted and the claim has been amended to recite computing a goodness of fit value for each calibration solution based on the difference between the field observed value and the modeled simulated val-

ues....” This limitation is supported by the Specification at page 5, lines 16-19, and throughout the Specification. In Claim 3 the word “normalized” has been cancelled. The limitation set forth in sub paragraph (B) of claim 3 is expressly supported by the Specification at page 9, lines 1-7.

In claim 10, step (A) has been amended to more closely track the language of the Specification at page 7, lines 14-17. In claim 10, subparagraph C is supported throughout the Specification and, particularly at page 7, lines 19-25. Sub-paragraph (D) has been amended to delete the reference to saving the information as this subject matter is contained in amended Claims 12 and 13.

Claim 11 has been cancelled.

With respect to claim 12, the amended portion is supported by the Specification at page 5, lines 28- page 6, line 4.

Claim 16 has been amended to delete the reference to demand multiplier, however the limitation “roughness multiplier” is supported by the Specification at page 9, lines 8-10.

Claims 19-22 have been cancelled.

Claim Objections

Claim 10 has been amended to include the phrase “a calibration module configured to produce”. This corrects the error noted by the Examiner. Claim 19 has been cancelled.

Response to Claim Interpretation

The Examiner has indicated that link status defines whether a link is opened or closed. Applicant agrees with this statement. However, the Examiner goes on to state that “this is identical to pipe flow being zero or non-zero. As such, link status is an inherent property of pipe flow. Any prior art teaching pipe flow inherently teaches link status.” Applicant respectfully disagrees with this characterization of the concept of link status.

More specifically, link status is a different attribute from pipe flow. Initially it is noted that a link is not necessarily always a pipe. Instead a link can be a pipe, a valve or a pump. In addition, link status is the attribute that indicates the state of operation for a pipe, valve and pump, mainly whether the link is opened or closed (or on or off) as stated by the Examiner. However, pipe flow is a quantitative attribute that indicates how much water is passing through a pipe. Pipe flow can be zero or greater than zero when a pipe is opened. A closed pipe cannot have any water passing through, but one cannot infer that a zero-flow pipe is a closed pipe. In other words, a pipe may have a zero flow, but it is not physically closed. Therefore, one cannot infer link status from pipe flow.

Importantly, in accordance with Applicant’s invention, link status is one type of model calibration variable to be optimized while pipe flow is taken as an observed value to be matched for a water distribution calibration. In other words, pipe flow is input data, but link status is a model calibration variable to be optimized.

Therefore, Applicant respectfully disagrees with the claim interpretation as stated and requests the Examiner to reconsider this interpretation.

Regarding claim 10, line 21, the claim indicates the phrase “and link status.”

Claim Rejections – 35 U.S.C. §112

Claims 1-22 were rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. Claims 1, 11, 17, and 19-22 have been cancelled herein, without prejudice. We now address the rejections of those claims still pending in the application.

Claim 2 has been amended to delete the phrases noted by the Examiner, and the claim as it now reads is supported in the Specification at page 5, lines 16 – 19, which states: “The calibration module evaluates how closely the model simulation is to the observed data. In doing so, the calibration evaluation computes a “goodness-of-fit” value, which is the discrepancy between the observed data and the model predicted pipe flows and junction pressures or HGL, for each solution.”

Claim 3 has been amended to delete the word “normalized.”

Claim 10 has been amended to delete the reference to saving the information in the model database. This aspect of the invention is claimed in Claims 12 and 13. The manner in which data is thereby saved will be readily understood by those skilled in the art.

In Claim 10, the word “formatted” has been changed to the word “configured,” which is a commonly used term to indicate that a software process is written to perform a particular function, as will be understood by those skilled in the art. The phrase “demand

group” has been deleted. “Roughness group” is disclosed in the Specification at Page 8, lines 8 -10. “Weighting function” is disclosed in the Specification at Page 9, lines 3-7.

In Claim 12, the “top solution” is described in a number of places throughout the Specification, one of which appears at page 5, line 28 - 30, which states: “Multiple near optimal solutions can be made available at the end of the genetic algorithm run. The best solution can be kept, and a number of top solutions produced are also kept.” This will be readily understood by those skilled in the art to mean that the best solution providing the best fit is obtained, and several others can be kept that are top solutions being, for example, “of the highest quality, amount or degree....” (Merriam Webster’s Collegiate Dictionary, Tenth Edition, 1996).

Claim 16, “roughness multiplier” is disclosed and supported by the Specification at page 9, lines 8 – 10. Claim 16 has been amended to refer to “identifying” link status.

Claim 18 has been amended to more closely track the language of the Specification at page 10, lines 5-6, and lines 19-20.

Paragraph 19 of the Office Action contains rejections under 35 U.S.C. §112, second paragraph, in response to which the Application has made the following amendments or has the following comments:

In Claim 2, the phrases noted have been deleted from the claim.

In Claim 3, proper antecedent basis for “said weighting factor” can be found in paragraph (A), line 14 of the claim.

In Claim 10: “selected field data sets” has been amended to “field data.” Also in claim 10, “and or more” has been corrected to “and one or more.”

Claim 11 has been cancelled.

In Claim 12, “at the end” “all” and “any” have been deleted.

In Claim 15, link status “includes operational status being opened or closed” has been changed to “link status is a status of being opened or closed....”

Claim 16 has been amended to state that link status is “identified.”

Claims 17, 21 and 22 have been cancelled.

Claim Rejections – 35 U.S.C. §102

Claims 1, 4-5, 7-9, 15-17, 22 were rejected under 35 U.S.C. §102. However, Claims 1, 17 and 22 have been cancelled and the dependency of claims 4-5, 7-9 and 15 and 16 have been changed to claim 2 which has been amended herein to meet the rejections and rejections of the Examiner, and which is thus in condition for allowance.

Claim Rejections - 35 U.S.C. §103

Claim 6 has been amended herein to depend upon claim 2 which in turn has been amended herein to meet the rejections and rejections of the Examiner. It is believed that Claim 2, and thus Claim 6, are in condition for allowance.

Allowable Subject Matter

Claims 2-3 have been indicated as allowable if rewritten to overcome the objections in the Office Action and the rejections under 35 U.S.C. §112, first and second para-

graphs, and to include all of the elements of the base claim. Claim 2 has been so amended, and Claim 3 depends upon claim 2.

Applicant also notes that the Walters reference does not disclose, teach or suggest link status being taken into account as a parameter for model calibration. Walters focuses only upon pipe roughness as a calibration parameter. Walters does not disclose or suggest link status or junction demand as calibration parameters. Accordingly, claim 2 as amended is allowable over Walters.

Claim 3 has been amended to overcome the objections and rejections set forth in the Office Action and is thus in condition for allowance.

Claim 10 has been indicated as allowable. Claim 10 has been amended herein to address the objections and rejections pursuant to §112, and it is respectfully submitted that independent claim 10 is in condition for allowance. Claims 12-14 and 18 depend upon claim 10, and are thus also in condition for allowance.

Claims 15 and 16 depend upon Claim 2, which has been amended herein and is believed to be in condition for allowance. Therefore, Claims 15 and 16, being dependant upon an allowable independent claim, are also in condition for allowance.

Summary

All of the rejections and objections made by the Examiner have been addressed herein. All of the claims have been amended herein either directly or through dependency and it is respectfully submitted that the present amendment places the application in condition for allowance.

Please charge any additional fee occasioned by this paper to our Deposit Account
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Respectfully submitted,

A handwritten signature in black ink, appearing to read "Rita M. Rooney", is written over a horizontal line.

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